

REMARKS

§ 112 Rejection:

The Examiner has rejected claims 1-9 under § 112 stating that the amendments to claim 1 were not supported in the specification and, thus, have added new matter to claims 1-9. The Applicants respectfully disagree and believe that adequate support for the amendments previously made may be found in the specification. Nevertheless, since the Examiner has indicated that no patentable weight will be given to the language “for placement on top of soil”, this language has been removed from the preamble of claim 1. With respect to the language “providing a more entangled fiber layer than non-woven mats comprising one-dimensional polymer fibers, to break up the flow and energy of water passing over the soil and said mat”, the Applicants believe that this language does distinguish the Applicants’ invention from those applied by the Examiner, as described more completely below. Support for this language may be found on page 5, lines 28-30, which describes the multipoint cross-section of the fibers as capturing sediment and water, and on page 8, lines 25-27, which discusses the mat’s ability to absorb the impact force of raindrops. Finally, on page 14, line 27 through page 15, line 10, the fiber’s ability to break up the flow and energy of water passing over the mat is evidenced by the reduction in flow-induced shear stress. One of ordinary skill reading the specification would understand the fiber’s ability to provide a more entangled fiber layer that breaks up the flow and energy of water passing over the soil and the mat. Consequently, the Applicants believe that the language added to claim 1 is supported and respectfully requests reconsideration of the new matter rejection.

§ 103 Rejections:

The Examiner has rejected claims 1-9 as obvious over Bohannon, Jr. in view of Lancaster and Freed. The Applicants respectfully disagree because this combination fails to teach the claimed invention, and, moreover, one of ordinary skill would not be motivated to combine the applied patents as suggested by the Examiner. In particular, none of the applied patents contain any suggestion to incorporate a multi-lobed fiber

in a turf reinforcement mat. The Federal Circuit has held that when the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination. *Heidelberger Druckmaschinen AG v. Hantscho Commercial Products, Inc.*, 30 U.S.P.Q. 2d 1377, 1379-80 (Fed. Cir. 1994). It should also be considered whether one skilled in the art with the references before him could have made the combination of elements claimed without the exercise of invention. *Application of Shaffer*, 229 F.2d 476, 479 (C.C.P.A. 1956). The art applied should be viewed by itself to see if it fairly disclosed doing what an applicant has done. *Id.* If the art did not do so, the references may have been improperly applied. *Id.* Recognizing the importance of the applicant's identification of a particular problem, the Court of Claims and Patent Appeals went on to say, "if a person having the references before him would not be informed of the problem solved by the applicant's invention, it cannot be said that the references could have suggested the solution." *Id.* at 480. Indeed, the Board of Patent Appeals has held that "it is well settled that where the claimed invention solves a problem, the discovery of the source of the problem and its solution are considered to be part of the invention as a whole under 35 U.S.C. § 103." *Ex parte Hiyamizu*, 10 U.S.P.Q. 2d 1393, 1394-95 (BPAI 1988).

With that in mind, the Applicants identified the particular problems of improving re-vegetation, providing erosion protection and improved water quality on slopes, and have provided a novel mat incorporating multi-dimensional fibers as a solution. The applied patents, Bohannon, Jr., and Lancaster, describe synthetic fiber-filled erosion control mats or blankets that use single-dimensional cross-section fibers to control erosion. Lancaster uses natural fibers, namely coconut strands, as a filler material, while Bohannon, Jr., uses crimped fibers constructed from recycled soda bottles. Lancaster is designed for use as a channel lining and includes a folded netting structure that defines peaks and troughs adapted to collect sediment and secure the mat. Bohannon, Jr., focuses on the problem of matting materials losing their loft and three dimensionality, causing the fibers to become more tightly packed, and inhibiting plants

from growing through the mat. To address this problem, a crimped fiber made of recycled soda bottles is used to provide loft and resiliency within the mat. As acknowledged by the Examiner, neither of these patents discloses the use of a multi-dimensional fiber as claimed by the Applicants. The Supreme Court has held that the fact that a claimed invention is not explicitly taught in a crowded art is evidence of non-obviousness. *U.S. v. Adams*, 383 U.S. 39, 52 (1966). Here, the erosion control mat art is a crowded art with many variations in fiber type and shape focusing on the central theme of creating a mat material. Yet, despite the significant inventive effort within this art, the Applicants' claimed mat having a multi-dimensional fiber is not disclosed. Under *Adams*, this fact is evidence of non-obviousness.

To address the multi-dimensional fiber feature, the Examiner looked outside of the erosion control mat art and cited Freed, which does not address erosion control and does not relate to a fiber mat. Instead, Freed relates to a method for improving the appearance and performance characteristics of turf surfaces by punching individual fibers into the soil. While Freed discloses a number of fibers, including a multi-lobal fiber, it does not suggest the suitability of such a fiber in a mat material. None of the applied patents contemplates the problem of modifying the cross section of the fiber to absorb the energy from flowing or falling water. Consequently, one of ordinary skill viewing only the applied patents would not find sufficient suggestion or motivation to incorporate the multi-lobe fibers mentioned in Freed into the mat materials described in Bohannon, Jr., and Lancaster.

The *Application of Shaffer* case provides a useful analogy. There, the applicant's invention concerned an apparatus used for titration. The applicant's apparatus differed from the applied art in that the applied art used an electromechanical amplifier, and the applicant had replaced the electromechanical amplifier with an electrical amplifier. The electrical amplifier was known and disclosed in a separate patent applied by the Examiner. The applicant, however, had identified a problem with the electromechanical amplifier, namely, the rapid fluctuation of current, which could be solved by use of the electromechanical amplifier. The Court of Claims and Patent

Appeals recognized that since the prior art had not identified this problem, it could not suggest the solution of replacing the electromechanical amplifier with an electronic amplifier.

Here, the prior art has not identified the disadvantage of using single-dimensional cross-sectional fibers, namely, their limited ability to absorb energy from flowing or falling water and entrap soil particles, reducing erosion on underlying soil surfaces and promoting re-vegetation. Moreover, these patents did not consider the problem of entrapping seeds within the fibers themselves. As demonstrated in the examples provided in the specification, when compared to an existing mat having round monofilament fibers, significant improvements in erosion control and re-vegetation were seen. For example, after 21 days, the sample according to the present invention showed a 71% improvement over the round cross-section monofilament fibers in the amount of seeds germinated per area (Table 1). Also, a 10% improvement in tensile strength in the machine direction and a 53% improvement in the cross-machine direction were observed (Table 2). In terms of resiliency, a 13% improvement was observed in a first round of tests, with 7% less soil loss (Table 3). Finally, when measuring the shear in a channel for erosion testing purposes, a 6% improvement in the shear stress was observed (Table 4). In addition to showing the significance of the problem identified and solved by the Applicants' invention, these results are believed to demonstrate objective evidence of the invention's non-obviousness. *In re Gal*, 980 F.2d 717 (Fed. Cir. 1992)(finding of obvious design choice precluded where the claimed structure and the function it performs are different from the prior art). See also, *In re Wright*, 6 U.S.P.Q. 2d, 1959, 1962 (Fed. Cir. 1988)(the patentability of a combination of old elements to achieve a new combination obtaining results not suggested in the references is of ancient authority).

Freed merely lists multi-lobed fibers as one fiber suitable for its plugging of fibers into soil. Since Freed concerns plugging individual fibers or bundles of fibers directly into the soil, Freed is believed to be non-analogous art. To be analogous art, the reference must be within the inventor's field of endeavor, or, if not within the inventor's

field of endeavor, it must be reasonably pertinent to the particular problem with which the inventor was involved. *In re Wood*, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979). Here, Freed is contrasted with the Applicants' invention and the Bohannon, Jr. and Lancaster patents in that it does not relate to an erosion control mat. Instead, Freed deals with reinforcement of soil by plugging individual fibers or fiber bundles directly into the soil. Similarly, it is not reasonably pertinent to the particular problem with which the inventors were involved because the inventors were concerned with the problem of making a mat that promotes re-vegetation, provides erosion protection, and improves water quality on slopes and in channels. In contrast, Freed is concerned with the enhancement of soils at the root level to reinforce turf against mechanical wear, thereby improving the appearance and performance of a playing surface. Freed does not contemplate the particular problems of promoting re-vegetation, providing erosion protection, and improving water quality on slopes and in channels contemplated by the inventors. Nor, does Freed consider the problem of making a mat material suitable for these purposes. Consequently, Freed is non-analogous art and would not ordinarily be brought to the attention of one of ordinary skill practicing in the Applicants' field of endeavor. *In re Wood*, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979).

Moreover, one of ordinary skill would not be motivated to combine Freed with Bohannon, Jr. and Lancaster as suggested by the Examiner. As discussed in column 4, lines 4-16, Freed contemplates the dispersion of fibers within soil to improve the properties of the soil and develop cohesion between the fibers and the soil. This cohesion is desirable in Freed to prevent the soil, fibers, and vegetation that form the playing surface from being torn apart by the physical activity on the surface. While Freed lists a multi-lobe fiber as being suitable for providing cohesiveness between the soil and fibers, no discussion of the ability of the fiber to absorb the impact of raindrops or collect and channel sediment and water is suggested. Also, Freed does not discuss the suitability of such a fiber in the formation of mat materials. For that matter, Bohannon, Jr. and Lancaster do not describe the suitability of multi-lobe fibers in mat material either. Those patents are limited to single-dimensional fibers commonly found

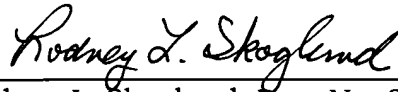
in the art. Without this suggestion, one of ordinary skill would not be motivated to incorporate a multi-dimensional fiber within the Bohannon, Jr. mat as suggested by the Examiner. Therefore, considering the invention as a whole, the claimed invention is not obvious to one of ordinary skill.

Indeed, Freed discloses the use of fibers that are plugged directly into the soil and form part of a playing surface by protruding at least partially from the soil. In the background section, Freed distinguishes its system from mat systems that deal with erosion as opposed to improving the appearance and playing characteristics of turfed surfaces (column 1, line 32 through column 2, line 21). To improve the appearance and playability of turf surfaces, Freed is concerned with impact and shear forces created by humans and animals. These forces are drastically different in magnitude and mode of application from the erosive forces considered by the Applicants' invention. As a result, Freed diverges from the mat art and offers a significantly different solution by plugging fibers directly into the soil, such that the individual fibers form part of the playing surface. Since Freed teaches away from the mat systems employed in Bohannon, Jr. and Lancaster, one of ordinary skill would not be motivated to combine these patents as suggested by the Examiner. In light of the foregoing, the Applicants believe that claims 1-9 are not obvious and respectfully request reconsideration of the Examiner's rejection.

The Applicants have submitted new claim 18 claiming another feature of the present invention. In particular, the new claim recites the limitation that the fibers making up the mat material include at least three lobes defining channels therebetween that are adapted to capture sediment and water. Support for this claim may be found on page 8, lines 25-30 and Fig. 3A. Since none of the applied patents describe fibers having at least three lobes defining channels therebetween for capturing sediment and water, the Applicants believe that claim 18 is in condition for allowance. Overall, Applicants believe that claims 1-9 and 18 are allowable and earnestly request Notice of the same. The Applicants believe that the foregoing amendment and response

address all issues raised by the Examiner. If any issues remain, however, the Applicants would appreciate a phone call to the undersigned attorney.

Respectfully submitted,



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